Remarks:

Applicants (hereinafter, Applicant) hereby request reconsideration of the application.

Claims 1 to 13 are now in the application. Claims 1 and 11 have been amended. Claims 14-15 have been added.

In item 3 on page 2 of the above-identified Office action, claims 1 to 6 and 9 to 13 have been rejected as being obvious over Ichihashi (U.S. Pat No. 5,838,718) in view of Richardson (U.S. Pat No. 5,905,962) and Chennakeshu et al. (U.S. Pat No. 5,283,811) (hereinafter "Chennakeshu") under 35 U.S.C. § 103.

In item 4 on page 5 of the Office action, claims 7 and 8 have been rejected as being obvious over Ichihashi, Richardson, and Chennakeshu in view of Hottinen et al. (U.S. Pat No. 5,995,499) under 35 U.S.C. § 103.

The rejections have been noted and the claims have been amended in an effort to even more clearly define the invention of the instant application.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claim 1 calls for, *inter alia*, a method for data transmission via a radio interface in a radio communications system, which comprises the following steps:

> *assigning one connection via a radio interface a given number of at least two data channels, whereby the data channels can be distinguished by an individual spreading code;*
>
> *transmitting in the data channels data symbols and, in addition, training sequences with known symbols; and*

utilizing for at least two of the data channels of the connection one common training sequence different from training sequences of other connections. (Emphasis added.)

Accordingly, in the instant application's method for data transmission via a radio interface in a radio communications system, at least two data channels are assigned to one connection. Each data channel can be distinguished by an individual spreading code. In addition to data symbols, midambles with known symbols are transmitted in a data channel. The number of midambles used for the connection is less than the number of data channels. The method is

particularly suitable for use in TD/CDMA 3rd generation mobile radio networks.

In the Ichihashi reference (which deals with frequency hopping methods), CDMA codes are used, which determine the provided hopping sequence individually for each connection. These, however, are not spreading codes. A *spreading code* causes a band spreading of the data to be transmitted, so that a *broadband* data transmission takes place. In contrast, the CDMA-code in a frequency hopping CDMA method does not affect band spreading, but only indicates hopping sequences with which the data to be transmitted are transmitted in different (narrow band) frequency bands. All connections utilize the same broad frequency band and are only differentiated by their individual spreading codes. In frequency hopping CDMA, a *narrowband* transmission takes place for each connection in time-alternating frequency bands. The change that takes place according to the aforementioned hopping sequence is individually determined for each connection by the assigned hopping code.

Further, additional claims 14-15, which include the term "direct sequence", clarify that the spreading code is a direct sequence spreading code. The difference between CDMA codes in frequency hopping and direct sequence-CDMA methods is more clearly emphasized.

Due to the fact that Ichihashi does not disclose using "spreading codes", a person of skill in the art cannot arrive at claim 1 via a combination with Richardson and Chennakeshu. See col. 1, lines 35 to 43; col. 4, lines 61++. Richardson describes a GSM mobile radio system and Chennakeshu describes a system according to IS-54 standard. Both GSM and IS-54 systems use TDMA-subscriber separating methods, which do not have any CDMA components. Thus, Richardson and Chennakeshu do not disclose any (direct sequence) spreading codes.

Regarding the Examiner's assertions that when different spreading codes are used (in the GSM System of Richardson), identical midambles can be distinguished at the receiver, Applicant states that GSM uses a TDMA/FDMA subscriber separating method in which, a CDMA component (i.e., a spreading code) is not used; thus, identical midambles in Richardson cannot be differentiated by such spreading codes. On page 9 of the last response to the previous Office action, dated May 16, 2002, Applicant mentioned a book by Mouly and Pautet to prove that (in the GSM standard discussed in Richardson) different midambles are generally provided for each channel. Thus, a skilled artisan cannot arrive at using the same midamble for several channels of Richardson as asserted by the Examiner. Doing so would be in contrast to the GSM standard. Richardson thus does not provide any

information towards providing the same midamble for several channels of the same connection.

With respect to the Examiner's statements regarding motivation to combine the references, Applicant submits that a skilled artisan has no reason to combine the three references. This can be seen from the fact that the references pertain to entirely different subscriber separating methods, or entirely different mobile radio standards, respectively. As already mentioned, Ichihashi pertains to a frequency hopping CDMA method, while Richardson pertains to a TDMA/FDMA GSM system, while Chennakeshu pertains to a TDMA IS-54 system.

Even if a skilled artisan were to consider a combination of the three references, he or she would not arrive at the *present invention*. This is so because none of the three references provides a direct sequence "spreading code" for differentiating the different channels. Further, the references do not teach or suggest that the same training sequences can be used for several channels of the same connection instead of different training sequences. As explained above, a skilled artisan cannot arrive at such a process, since (according to the GSM standard disclosed by Richardson), different midambles are required for each channel.

Applicant further submits that considering claim 1 to be obviated by the state of the art is a hindsight consideration. By using the same training sequences for several data channels, the instant application proposes (for the first time) to reduce the amount of used training sequences, which are necessary, so that the largest possible number of connections can exist simultaneously for a given number of available training sequences.

Clearly, the references do not show "*assigning one connection via a radio interface a given number of at least two data channels, whereby the data channels can be distinguished by an individual spreading code; transmitting in the data channels data symbols and, in addition, training sequences with known symbols; and utilizing for at least two of the data channels of the connection one common training sequence different from training sequences of other connections*", as recited in claim 1 of the instant application (emphasis added). Thus, neither can the specific combination of the aforementioned limitations be shown. Claim 11 recites similar limitations.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claims 1 or 11. Claims 1 and 11 are, therefore, believed to be patentable over the art and

since all of the dependent claims are ultimately dependent on claims 1 or 11, they are believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1-15 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, the Examiner is respectfully requested to telephone counsel so that, if possible, patentable language can be worked out.

Please charge any fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and

Greenberg, P.A., No. 12-1099.

Respectfully submitted,

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For Applicant

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

Claim 1 (twice amended). A method for data transmission via a radio interface in a radio communications system, which comprises the following steps:

assigning one connection via a radio interface a given number of at least two data channels, whereby the data channels can be distinguished by an individual [spread] spreading code;

transmitting in the data channels data symbols and, in addition, training sequences with known symbols; and

utilizing for at least two of the data channels of the connection one common training sequence different from training sequences of other connections.

Claim 11 (twice amended). A radio station for data transmission in a radio communications system via a radio interface, comprising:

a control device for assigning at least two data channels to a connection in a radio communications system;

wherein each data channel can be distinguished by an individual [spread] spreading code, and

wherein data symbols and, in addition, training sequences with known symbols are transmitted in a data channel;

a signal processor using for at least two of the data channels of the connection one common training sequence different from training sequences of other connections.